

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A curve's radius estimation device for estimating a curve's radius of a road on which a vehicle shall run, comprising:
_____ a vehicle speed sensor ~~for detecting~~ detects an actual speed of the vehicle;
_____ a yaw rate sensor ~~for detecting~~ detects an actual yaw rate of the vehicle;
_____ a steering angle sensor ~~for detecting~~ detects an angle of a steering wheel handled by a driver of the vehicle as an actual steering angle; and
_____ an estimator ~~for estimating~~ estimates the curve's radius on the basis of the actual vehicle speed detected by the vehicle speed sensor, the actual yaw rate detected by the yaw rate sensor, and the actual steering angle detected by the steering angle sensor.

2. (Currently Amended) The curve's radius estimation device as claimed in claim 1, the estimator comprising:
_____ a base value estimation part ~~for estimating~~ estimates the curve's radius as a base value on the basis of the actual vehicle speed and the actual yaw rate but not of the steering angle; and
_____ an estimation part ~~for determining~~ determines an amount of correction for the base value on the basis of physical quantity regarding the steering angle, and ~~estimating~~ estimates the curve's radius by correcting the base value with the amount of correction.

3. (Currently Amended) The curve's radius estimation device as claimed in claim 2, the estimator further comprising an enabling part ~~for enabling~~ enables the estimation of the curve's radius when an expected value of the curve's radius is equal to or below a predetermined value and a state of temporal variation of the curve's radius does not exceed a predetermined state for a predetermined time period or longer.

4. (Currently Amended) The curve's radius estimation device as claimed in claim 3, the estimator further comprising a setting part ~~for setting~~ sets the predetermined time period such that the predetermined time period is shortened as the actual vehicle speed increases.

5. (Currently Amended) The curve's radius estimation device as claimed in claim 1, the estimator comprising an estimation part ~~for estimating~~ estimates the curve's radius such that an estimate of the curve's radius responds to the variation of the actual steering angle more sensitively when an expected value of the curve's radius is relatively small than when the expected value is relatively large.

6. (Currently Amended) The curve's radius estimation device as claimed in claim 2, the estimator further comprising a part ~~for determining~~ determines the amount of correction for the base value using a product of an amount of variation of the base value per a certain range of the actual steering angle, an amount of variation of the actual steering angle per a certain time period, and a coefficient that increases as an expected value of the curve's radius decreases, and estimating the curve's radius by correcting the base value with the determined amount of correction.

7. (Currently Amended) A curve's radius estimation device for estimating a curve's radius of a road on which a vehicle shall run, comprising:

_____ a vehicle speed sensor ~~for detecting~~ detects an actual speed of the vehicle;

_____ a yaw rate sensor ~~for detecting~~ detects an actual yaw rate of the vehicle;

_____ a steering angle sensor ~~for detecting~~ detects an angle of a steering wheel handled by a driver of the vehicle as an actual steering angle; and

_____ an estimator ~~for estimating~~ estimates the curve's radius, the estimator comprising:

_____ a first estimation part ~~for estimating~~ estimates the curve's radius on the

basis of the actual vehicle speed and the actual yaw rate but not of the actual steering angle as a first estimate;

_____ a second estimation part for estimating the curve's radius on the basis of the actual vehicle speed, the actual yaw rate, and the actual steering angle as a second estimate; and

_____ a final value acquisition part ~~for acquiring~~ acquires a final value of the estimate of the curve's radius using selectively or collectively those estimated first and second estimates.

8. (Currently Amended) The curve's radius estimation device as claimed in claim 7, the final value acquisition part comprising a selection part ~~for selecting~~ selects the larger one of the first and second estimates as the final value of the curve's radius.

9. (Currently Amended) The curve's radius estimation device as claimed in claim 7, the estimator further comprising an enabling part ~~for enabling~~ enables the acquisition of the second estimate when an expected value of the curve's radius is equal to or below a predetermined value and a state of temporal variation of the first estimate does not exceed a predetermined state for a predetermined time period or longer.

10. (Currently Amended) The curve's radius estimation device as claimed in claim 9, the estimator further comprising a setting part ~~for setting~~ sets the predetermined time period such that the predetermined time period is shortened as the actual vehicle speed increases.

11. (Currently Amended) The curve's radius estimation device as claimed in claim 7, the second estimation part comprising a part ~~for acquiring~~ acquires the second estimate on the basis of an amount of variation of the first estimate per a certain range of the actual steering angle and an amount of variation of the actual steering angle per a certain time period.

12. (Currently Amended) The curve's radius estimation device as claimed in claim 7, the second estimation part comprising a part ~~for acquiring~~ acquires the second estimate using a product of an amount of variation of the first estimate per a certain range of the actual steering angle, an amount of variation of the actual steering angle per a certain time period, and a coefficient that increases as an expected value of the curve's radius decreases.

13. (Currently Amended) The curve's radius estimation device as claimed in claim 7, the second estimation part comprising a part ~~for determining~~ determines an amount of correction for the first estimate using a product of an amount of variation of the first estimate per a certain range of the actual steering angle, an amount of variation of the actual steering angle per a certain time period, and a coefficient that increases as an expected value of the curve's radius decreases, and acquiring the second estimate by correcting the first estimate with the determined amount of correction.

14. (Withdrawn - Currently Amended) The curve's radius estimation device as claimed in claim 7, the first estimation part comprising a part ~~for acquiring~~ acquires an original value of the first estimate on the basis of the actual vehicle speed and the actual yaw rate but not of the actual steering angle, and filtering the acquired original value with a particular characteristic so as to acquire a final value of the first estimate, the particular characteristic being a low response characteristic to the original value in a region where the vehicle running state is expected to be nearly a straight running state, and being a high response characteristic to the original value in a region where the vehicle running state is expected to be nearly a turning state.

15. (Withdrawn - Currently Amended) A curve's radius estimation device for estimating a curve's radius of a road on which a vehicle shall run, comprising:

_____ a vehicle speed sensor ~~for detecting~~ detects an actual speed of the vehicle;

_____ a yaw rate sensor ~~for detecting~~ detects an actual yaw rate of the vehicle; and

_____an estimator ~~for acquiring~~ acquires an original value of the curve's radius on the basis of the actual vehicle speed detected by the vehicle speed sensor and the actual yaw rate detected by the yaw rate sensor, and filtering the acquired original value with a particular characteristic so as to acquire a final value of the curve's radius, the particular characteristic being a low response characteristic to the original value in a region where the vehicle running state is expected to be nearly a straight running state, and being a high response characteristic to the original value in a region where the vehicle running state is expected to be nearly a turning state.

16. (Withdrawn - Currently Amended) The curve's radius estimation device as claimed in claim 1, the estimator comprising a determination part ~~for determining~~ determines that the vehicle is under a straight running state when the actual vehicle speed is equal to or below a predetermined speed regardless of detected values of the actual yaw rate.

17. (Withdrawn - Currently Amended) A curve's radius estimation device for estimating a curve's radius of a road on which a vehicle shall run, comprising:

_____a vehicle speed sensor ~~for detecting~~ detects an actual vehicle speed of the vehicle;

_____a turning state quantity sensor ~~for detecting~~ detects a turning state quantity representing a turning state of the vehicle; and

_____an estimator ~~for estimating~~ estimates the curve's radius on the basis of at least the turning state quantity of the actual vehicle speed detected by the vehicle speed sensor and the turning state quantity detected by the turning state quantity sensor, the estimator determining that the vehicle is under a straight running state when the actual vehicle speed is equal to or below a predetermined speed regardless of detected values of the actual yaw rate.

18. (Currently Amended) A preceding vehicle existence determination apparatus comprising:

_____ the curve's radius estimation device claimed in claim 1;

_____ a sensor provided in the vehicle ~~for detecting~~ detects an object located in front of the vehicle; and

_____ a determiner ~~for determining~~ determines a present lane probability in which a preceding vehicle is running on the same lane with the present vehicle when the object detected by the sensor is a moving object that is the preceding vehicle, and ~~determining~~ determines that a preceding vehicle exists for which the present vehicle ~~should make track~~ is tracking when the determined present lane probability is equal to or exceeds a predetermined probability, the determiner ~~determining~~ determines the present lane probability on the basis of output signals of the sensor and the curve's radius estimated by the curve's radius estimation device in accordance with a predetermined relationship between at least one of a first distance and a second distance and the present lane probability, and, the first distance representing how far the preceding vehicle is out of the lane in a lane-width direction, and the second distance representing how far the preceding vehicle is away from the present vehicle along with the lane in a vehicle traveling direction.